



Fire & Ice Pre-/Post-Visit Activity Age of the Earth

Objectives:

Students will:

- Create a time line outlining major events in the Earth's history.

State Learning Results Addressed (Grades 5–8):

Science and Technology: D.1, D.2, F.3, L.4

Mathematics: A.3, A.4, B.2

Materials:

- Ruler/tape measure
- Art supplies: Could include string, colored paper, tape, etc.

Activity: Have the class build a timeline of the Earth's history. This can be done in small groups or as a class.

- Select the events that are going to be included on the timeline and research their dates. A list of possibilities is included below.
- Pick a location and size for the timeline, perhaps one wall of the classroom.
- Develop a scale that will condense 4.6 billion years into the given space. (e.g., 1cm = 10 million years will condense the time line down to 4.6 meters or ~14 feet)
- Convert all the ages into distances.
- Plot the events on the timeline.
- You could have groups do some research on the time point(s) that they worked on and have them give a short presentation to the class on what was happening at that time and why it was significant.

Discussion Topics:

- How do geologists/biologists calculate the ages of different events?
- Post-Visit: What are some pieces of evidence we saw on Great Head that give us information on the relative ages of different rocks?

Event	Age Billion Years Ago (bya) Million Years Ago (mya) Years Ago (ya)	Distance from present (1cm = 10 million yrs)
Geologic		
Formation of the Earth	4.6 bya	4.6 meters (m)
Supercontinent of Rodinia	1.1–0.75 bya	1.1–0.75 m
Supercontinent of Pangea	237–195 mya	23.7–19.5 cm
Modern continental configuration	65 mya	6.5 cm
Last Ice Age begins	1.7 mya	.17cm
Biologic		
First life – single celled organisms (prokaryotes)	3.5 bya	3.5 m
Oxygen begins to accumulate in atmosphere	2.7 bya	2.7 m
First multicellular organisms	1.5 bya	1.5 m
Cambrian explosion – burst in animal diversity	542 mya	54.2 cm
Early vascular plants	443 mya	44.3 cm
First vertebrates and insects	416 mya	41.6 cm
First reptiles, abundant amphibians	360 mya	36 cm
Dinosaurs abundant	251–65 mya	25.1–6.5 cm
First flowering plants	145 mya	14.5 cm
First primates	34 mya	3.4 cm
First humans	1.8 mya	0.18 cm
Building of Egyptian pyramids	4000 ya	0.004 mm
Local		
Deposition of Ellsworth Schist (local metamorphic rock)	570–505 mya	57–50.5 cm
Folding and morphing of Ellsworth Schist	505 mya	50.5 cm
Deposition of Bar Harbor Formation (local sedimentary rock)	420–380 mya	42–38 cm
Granite Intrusion (igneous)	380–360 mya	38–36 cm
Last glaciation (Wisconsinian Glaciation)	25,000–13,000 ya	0.025–0.013 mm
Crust rebound complete	8,000 ya	0.008 mm
USA becomes a country	231 ya	0.0002 mm

Dates from:

Campbell, N.A., & Reece, J.B. (2005). *Biology*. Ed. 7. Boston: Pearson Education, Inc.

Gillman, Richard A., et al. 1988. *The Geology of Mount Desert Island: A Visitor's Guide to the Geology of Acadia National Park*. Augusta: Maine Geological Survey.

Grotzinger, John et al. (2007). *Understanding Earth*. Ed. 5. New York: W. H. Freeman and Company.

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